

REMARKS/ARGUMENTS

Claims 1-3, 5-7, and 9-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Genders et al (U.S. Patent No. 6,004,445).

Claim 1 is amended to recite a stack operation range of from pH 3 to pH 10. Support for this recitation is found on page 9, lines 19-22 of the Utility Application.

Newly added claim 21 depends from claim 1 and specifies certain cell sizes. Newly added claim 22 depends from claim 14 and also specifies certain cell sizes. Support for this limitation is found on page 4, lines 23-26 of the underlying Provisional Application.

Applicant's invention

The instant invention provides a method for continuously and automatically maintaining the pH of the process solutions, and particularly the byproduct solutions of a relatively large electrodialysis stack. The overall pH is maintained at between 3 and 10, a crucial feature inasmuch as the components of large stack configurations, catering to long dwell times, are susceptible to extreme alkaline or acid conditions.

Genders Does Not Maintain Byproduct pH

Claims 1-3, 5-7, and 9-20 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Genders et al (U.S. Patent No. 6,004,445). Applicant disagrees.

The invention calls for buffering product and byproduct solutions. By contrast, Genders uses no buffers.

Genders' objective is to continually produce ascorbic acid from its salt. Genders does this by adding an inorganic salt with the ascorbate to facilitate conductivity. The inorganic salt has the same cation as the ascorbate, and

completely dissociates to aid in conductivity of the cation to the base compartment. Nothing else is added in the product (acid) chamber of Genders' stack. The pH of the feed solution there is 1.5-2.0 because it is the pH of the solution. Genders does not add a buffer to control pH of the product (acid) solution.

Likewise, Genders adds no buffer to control the pH of the by-product (base) compartments. That is why the concentration of the by-product caustic (co-product) produced in the base compartment increases from 1.5 molar (pH = 13.7) to 2.3 molar (pH = 14.3). The caustic concentration builds up due to the lack of a buffer.

In light of the fact that Genders does not teach the use of buffers in its product and byproduct loops to maintain those compartments at optimized pH values, Applicants submit that the heretofore submitted claims are neither anticipated nor suggested by the art of record. Withdrawal of the §§102 and 103 rejections is respectfully solicited.

Genders Requires
Extreme pHs

While the pH within Genders' acid compartment may not vary more than two units, Genders' chemistry nevertheless compels it to operate at extreme ends of the pH range to start with. For example, and as noted in Column 10, lines 54-55, the ascorbate feed is "held at a pH of 1.0-2.0..." Further, the 2.3 M caustic Gender utilizes (Col 11, lines 64-65) equates to more than 14 pH.

Gender can operate at these pH extremes because it uses very small stacks. But applying Genders' chemistry to the large, slower, high capacity stacks, as now claimed, will destroy the invented system. Nothing in Genders' chemistry protects or buffers such a high capacity system from the extreme pH solutions generated in Genders.

Applicants have amended the claims to further differentiate from Genders. Specifically, the invention is further limited by specifying an operating pH range of between 3 and 10. Genders cannot operate in that relatively neutral pH range.

Also, the invention has been limited with the recitation of its large size (4000 square centimeters). Genders uses extremely small stacks, approximately 100 square centimeters.

It is noteworthy that Genders could not envision the new limitations now cited because Genders never experienced the effect which requires the fix the limitations embody. Flowrates of solution in a small stack are too high relative to the amount of electric current (as ion flow) that passes through the stack, and it is the current that leads to a change in pH of the solution. No one who uses small stacks, including Genders, has used (or needs) buffers to control pH within electrodialysis stacks because the need for pH control within small stacks does not exist.

In summary, the essence of the invention is the control of pH on the by-product side of an electrolysis cell. If the by-product has value, it is sometimes referred to as co-product (as in Genders). In our invention, the by-product solution pH is controlled with a buffer that is continuously regenerated outside the stack. Genders simply does not employ buffer to its byproduct (base) compartment.

An earnest attempt has been made hereby to respond to the September 17, 2008. All claims are deemed in condition for allowance. If the Examiner feels that a telephonic interview will expedite allowance, he is respectfully urged to contact the undersigned. Claims 1-3, 5-7, and 9-22 currently are pending in the application.

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Respectfully submitted,

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